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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,758	11/03/2003	Weize Xu	86063PCW	4239

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EXAMINER	
CUTLER, ALBERT H	

ART UNIT	PAPER NUMBER
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,758	XU, WEIZE	
	Examiner	Art Unit	
	Albert H. Cutler	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7-10 and 12-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7-10 and 12-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to communication filed on November 20, 2007. Claims 1, 3-5, 7-10 and 12-17 are pending in the application and have been examined by the Examiner.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 20, 2007 has been entered.

Response to Arguments

3. Applicant's arguments with respect to claims 1, 5 and 10 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 15-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Consider claim 15, Applicant claims the step of transferring the signals from each image capture pixel in each row of image capture pixels to the operational amplifier by placing the switches into a second state. In the response filed November 20, 2007, Applicant states that support for the amendments can be found in lines 4-31 on page 3 of Applicant's specification. However, upon examination of this subject matter, the Examiner has found nothing to suggest placing the switches into a second state in order to transfer the signals from each of the image capture pixels in each row of image capture pixels. Rather, a switch(40) has been defined for transferring dark reference pixels on one cycle when placed in a first state. There is no mention of the working of this switch(40) with respect to the transferring of image capture pixels.

Consider claim 16, Applicant claims the signals are transferred from each image capture pixel in each row of image capture pixels to the operational amplifier by placing the switches into a second state. In the response filed November 20, 2007, Applicant states that support for the amendments can be found in lines 4-31 on page 3 of Applicant's specification. However, upon examination of this subject matter, the

Examiner has found nothing to suggest placing the switches into a second state in order to transfer the signals from each of the image capture pixels in each row of image capture pixels. Rather, a switch(40) has been defined for transferring dark reference pixels on one cycle when placed in a first state. There is no mention of the working of this switch(40) with respect to the transferring of image capture pixels.

Consider claim 17, Applicant claims the signals are transferred from each active pixel in each row of active pixels to the operational amplifier by placing the switches into a second state. In the response filed November 20, 2007, Applicant states that support for the amendments can be found in lines 4-31 on page 3 of Applicant's specification. However, upon examination of this subject matter, the Examiner has found nothing to suggest placing the switches into a second state in order to transfer the signals from each of the image capture pixels in each row of image capture pixels. Rather, a switch(40) has been defined for transferring dark reference pixels on one cycle when placed in a first state. There is no mention of the working of this switch(40) with respect to the transferring of image capture pixels.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1, 3-5, 7-10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rossi(US 2004/0222351) in view of Mann(US 6,816,196).

Consider claim 1, Rossi teaches:

A method(paragraphs 0031-0075) for outputting signals from dark reference pixels(Rossi teaches a method outputting pixels, and in paragraph 0102, teaches that these pixels can be dark reference pixels.), the method comprising the steps of:

(a) providing an image sensor(figure 3) having rows and columns of pixels(See 104, 106, 108, paragraph 0004.), the upper portion including rows of only image capture pixels that convert incident light into a charge(see figure 3, paragraph 0004), the pixel array including rows of only dark reference pixels that are substantially shielded from light(See paragraphs 102 and 105. Rossi teaches that the present invention can be used to find the dark level of an image. This dark level can be found by averaging rows of dark pixels.);

(b) transferring the signals from the plurality of dark reference pixels to a plurality of sample and hold circuits(432, 434, 436, figure 3, paragraph 0005), wherein a sample and hold circuit is electrically connected to each column of pixels(see figures 3-5, paragraphs 0031-0042); and

(c) transferring signals substantially simultaneously from each of the plurality of sample and hold circuits(432, 434, 436) to an operational amplifier(464, figures 3, 4 and 6) on one clock cycle(see paragraphs 0031, 0048, 0075) by placing a switch(218, figure 4) electrically connected to each sample and hold circuit(432, 434, 436) into a first state(See paragraph 0075. Switch(218) is connected to sample and hold capacitors(622 and 626) of each column. The switch operates in a closed state in order to read out charges.), wherein the operational amplifier(464) produces a substantially average dark signal for each row of dark reference pixels(paragraphs 0054-0056, 102).

However, Rossi does not explicitly teach that the bottom portion includes rows of only dark reference pixels that are substantially shielded from light.

Mann is similar to Rossi in that Mann teaches of an imaging array(102, figure 1) containing image capture pixels(106) and rows of dark pixels(108). Mann is further similar in that that outputs from the dark pixels(108) are averaged in order to obtain an average dark reference signal(column 4, lines 26-38).

However, in addition to the teachings of Rossi, Mann teaches that the bottom portion includes rows of only dark reference pixels(108) that are substantially shielded from light(column 2, lines 60-62, column 3, lines 3-9 and lines 61-63, column 4, lines 26-

38, figure 1. Bottom is a relative term, and the Examiner interprets the portion of the image sensor(102) containing the dark rows(108) in figure 1 to be the bottom portion.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include the dark reference pixels as taught by Rossi in rows on the bottom portion of the imaging array as taught by Mann for the benefit of being able to read out dark current values and determine correction values prior to the reading out of the image capture pixels(see Mann, figure 4), and thus allowing noise to be removed and image quality to be improved(Mann, column 4, lines 33-38, column 6, lines 66-67).

Consider claim 3, and as applied to claim 1 above, Rossi further teaches providing a differential amplifier as the operational amplifier(464, paragraphs 0033, 0039, 0056).

Consider claim 4, and as applied to claim 1 above, Rossi further teaches step (b) further comprises transferring the pixel signals from the plurality of pixels to the plurality of sample and hold circuits on a row-by-row basis(paragraphs 0005, 0102).

Mann also teaches this limitation(column 3, lines 61-64).

Consider claim 5, Rossi teaches:

An image sensor assembly(figures 3-6) comprising:

(a) an image sensor(figure 3) having rows and columns of pixels(See 104, 106, 108, paragraph 0004.), the upper portion including rows of only image capture pixels that convert incident light into a charge(see figure 3, paragraph 0004), the imaging array including rows of only dark reference pixels that are substantially shielded from light(See paragraphs 102 and 105. Rossi teaches that the present invention can be used to find the dark level of an image. This dark level can be found by averaging rows of dark pixels.);

(b) a plurality of sample and hold circuits(432, 434, 436) for receiving signals from the dark reference pixels in each row of dark reference pixels(paragraphs 0005, 0102), wherein a sample and hold circuit(432, 434, 436) is electrically connected to each column of pixels(see figures 3-5, paragraphs 0031-0042);

(c) a switch(218) electrically connected to each sample and hold circuit(See paragraph 0075. Switch(218) is connected to sample and hold capacitors(622 and 626) of each column. The switch operates in a closed state in order to read out charges.) and

(d) an operational amplifier(464) for receiving the signals from each of the sample and hold circuits on one clock cycle when the switches are in a first state(See paragraph 0075. Switch(218) is connected to sample and hold capacitors(622 and 626) of each column. The switch operates in a closed state in order to read out charges.), wherein the operational amplifier produces an average dark reference signal for each row of dark voltage signals(paragraphs 0054-0056, 102).

However, Rossi does not explicitly teach that the bottom portion includes rows of only dark reference pixels that are substantially shielded from light.

Mann is similar to Rossi in that Mann teaches of an imaging array(102, figure 1) containing image capture pixels(106) and rows of dark pixels(108). Mann is further similar in that that outputs from the dark pixels(108) are averaged in order to obtain an average dark reference signal(column 4, lines 26-38).

However, in addition to the teachings of Rossi, Mann teaches that the bottom portion includes rows of only dark reference pixels(108) that are substantially shielded from light(column 2, lines 60-62, column 3, lines 3-9 and lines 61-63, column 4, lines 26-38, figure 1. Bottom is a relative term, and the Examiner interprets the portion of the image sensor(102) containing the dark rows(108) in figure 1 to be the bottom portion.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include the dark reference pixels as taught by Rossi in rows on the bottom portion of the imaging array as taught by Mann for the benefit of being able to read out dark current values and determine correction values prior to the reading out of the image capture pixels(see Mann, figure 4), and thus allowing noise to be removed and image quality to be improved(Mann, column 4, lines 33-38, column 6, lines 66-67).

Consider claim 7, and as applied to claim 5 above, Rossi further teaches that each of the sample and hold circuits(432, 434, 436) further comprises a charge storage element(622, 626) mated to each signal from the dark reference pixels, wherein a signal

from each charge storage element is passed to the operational amplifier(paragraphs 0034, 0041, 0048, 0050, 0054, 0056, 0075, 0102, figures 3-5).

Consider claim 8, and as applied to claim 5 above, Rossi further teaches providing a differential amplifier as the operational amplifier(464, paragraphs 0033, 0039, 0056).

Consider claim 9, and as applied to claim 5 above, Rossi further teaches step (b) further comprises transferring the pixel signals from the plurality of pixels to the plurality of sample and hold circuits on a row-by-row basis(paragraphs 0005, 0102).

Mann also teaches this limitation(column 3, lines 61-64).

Consider claim 10, Rossi teaches:

A camera(figure 1, paragraph 0105) comprising:

an image sensor(figure 3) having rows and columns of pixels(See 104, 106, 108, paragraph 0004.), the image sensor comprising:

(a) a plurality of active pixels(104) that receives incident light that is converted into a charge, wherein the plurality of active pixels are positioned only in an upper portion of the image sensor(see figure 3, paragraph 0004);

(b) a plurality of sample and hold circuits(432, 434, 436);

(c) a plurality of dark reference pixels positioned on the image sensor and each of which is responsive to light and each of which is substantially shielded from light(See

paragraphs 102 and 105. Rossi teaches that the present invention can be used to find the dark level of an image. This dark level can be found by averaging rows of dark pixels.), wherein signals from each of the dark reference pixels in each row is transferred to a respective one of the plurality of sample and hold circuits(paragraphs 0005, 0102);

(d) a switch(218) connected to each sample and hold circuit(432, 434, 436, figure 4. Switch(218) is connected to sample and hold capacitors(622 and 626).); and

(e) an operational amplifier(464) that receives a signal from each of the sample and hold circuits on one clock cycle when the switches are placed into a first state(See paragraph 0075. Switch(218) is connected to sample and hold capacitors(622 and 626) of each column. The switch operates in a closed state in order to read out charges.), wherein the operational amplifier(464) averages the signals from the sample and hold circuits(432, 434, 436) for providing an approximate average dark reference pixel signal for each row of dark reference pixels(paragraphs 0054-0056, 102).

However, Rossi does not explicitly teach that the lower portion includes rows of only dark reference pixels that are substantially shielded from light.

Mann is similar to Rossi in that Mann teaches of an imaging array(102, figure 1) containing image capture pixels(106) and rows of dark pixels(108). Mann is further similar in that that outputs from the dark pixels(108) are averaged in order to obtain an average dark reference signal(column 4, lines 26-38).

However, in addition to the teachings of Rossi, Mann teaches that the lower portion includes rows of only dark reference pixels(108) that are substantially shielded

from light(column 2, lines 60-62, column 3, lines 3-9 and lines 61-63, column 4, lines 26-38, figure 1. Lower is a relative term, and the Examiner interprets the portion of the image sensor(102) containing the dark rows(108) in figure 1 to be the lower portion.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to include the dark reference pixels as taught by Rossi in rows on the lower portion of the imaging array as taught by Mann for the benefit of being able to read out dark current values and determine correction values prior to the reading out of the image capture pixels(see Mann, figure 4), and thus allowing noise to be removed and image quality to be improved(Mann, column 4, lines 33-38, column 6, lines 66-67).

Consider claim 12, and as applied to claim 10 above, Rossi further teaches that each of the sample and hold circuits(432, 434, 436) further comprises a charge storage element(622, 626) mated to each signal from the dark reference pixels, wherein a signal from each charge storage element is passed to the operational amplifier(paragraphs 0034, 0041, 0048, 0050, 0054, 0056, 0075, 0102, figures 3-5).

Consider claim 13, and as applied to claim 10 above, Rossi further teaches providing a differential amplifier as the operational amplifier(464, paragraphs 0033, 0039, 0056).

Consider claim 14, and as applied to claim 10 above, Rossi further teaches step (b) further comprises transferring the pixel signals from the plurality of pixels to the plurality of sample and hold circuits on a row-by-row basis(paragraphs 0005, 0102).

Mann also teaches this limitation(column 3, lines 61-64).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert H. Cutler whose telephone number is (571)-270-1460. The examiner can normally be reached on Mon-Fri (7:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571)-272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NGOC-YEN VU
SUPERVISORY PATENT EXAMINER